

SUPPLEMENTAL AMENDMENT UNDER 37 C.F.R. § 1.111
Attorney Docket No.: Q77409
U.S. Application No.: 10/657,149

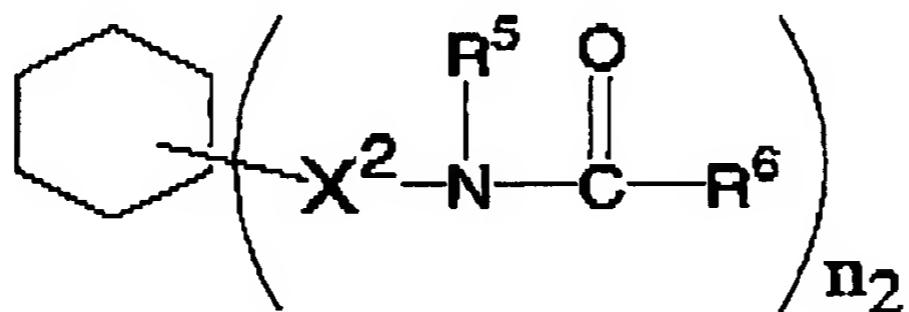
AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A chemical amplification type positive resist composition comprising

a nitrogen containing compound of the formula (IIIa):



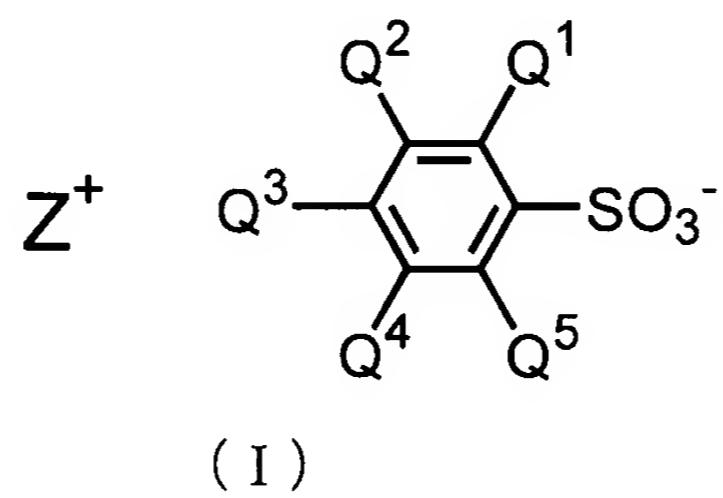
wherein X^2 represents alkylene having 1 to 4 carbon atoms or a single bond, R^5 represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one - CH_2 - other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, or an aromatic hydrocarbon group optionally substituted, R^6 represent hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one - CH_2 - other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, an aromatic hydrocarbon group optionally substituted, or arylamino optionally

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substituted, and n_2 denotes an integer of 1 to 5, with the proviso that when n_2 is 2 or more, each of $-X^2-NR^5-CO-R^6$ in the formula (IIIa) may be different,

a resin which contains a structural unit having an acid labile group and which itself is insoluble or poorly soluble in an alkali aqueous solution but becomes soluble in an alkali aqueous solution by the action of an acid and which further contains a structural unit derived from 2-norbornene and a structural unit derived from an aliphatic unsaturated dicarboxylic anhydride; and

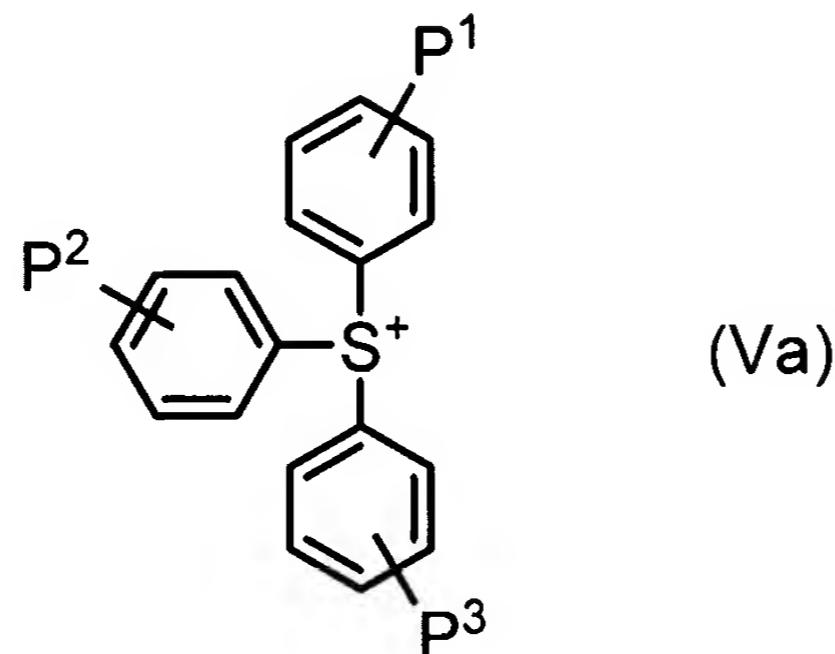
an acid generator of the formula (I):



wherein Q^1 , Q^2 , Q^3 , Q^4 and Q^5 each independently represent hydrogen, hydroxyl, alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 12 carbon atoms or an electron-withdrawing group, and Z^+ represents a group of the formula (Va), (Vb) or (Vc):

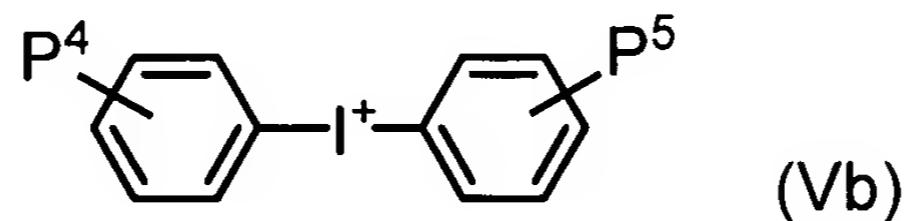
a group of the formula (Va):

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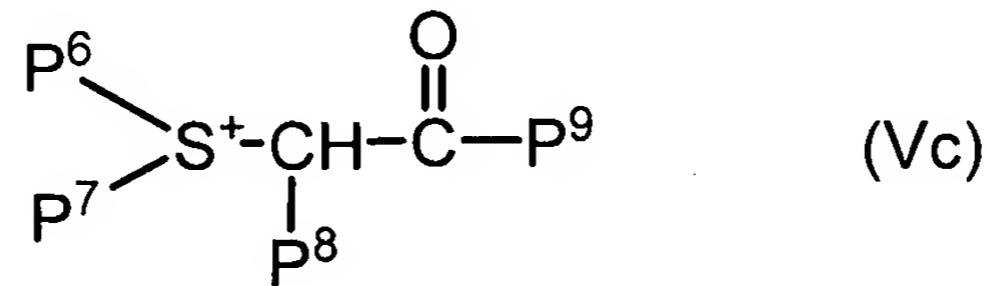
wherein P¹, P² and P³ each independently represent hydrogen, hydroxyl, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms;

a group of the formula (Vb):



wherein P⁴ and P⁵ each independently represent hydrogen, hydroxyl, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms;

a group of the formula (Vc):



wherein P⁶ and P⁷ each independently represent alkyl having 1 to 6 carbon atoms or cycloalkyl having 3 to 10 carbon atoms, or P⁶ and P⁷ bond to form divalent acyclic hydrocarbon having 3 to 7 carbon atoms which form a ring together with the adjacent S⁺, and at least one -CH₂- in the divalent acyclic hydrocarbon may be substituted by -CO-, -O- or -S-; P⁸ represents hydrogen, P⁹ represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon

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atoms or an aromatic group optionally substituted, or P⁸ and P⁹ bond to form 2-oxocycloalkyl together with the adjacent -CHCO-.

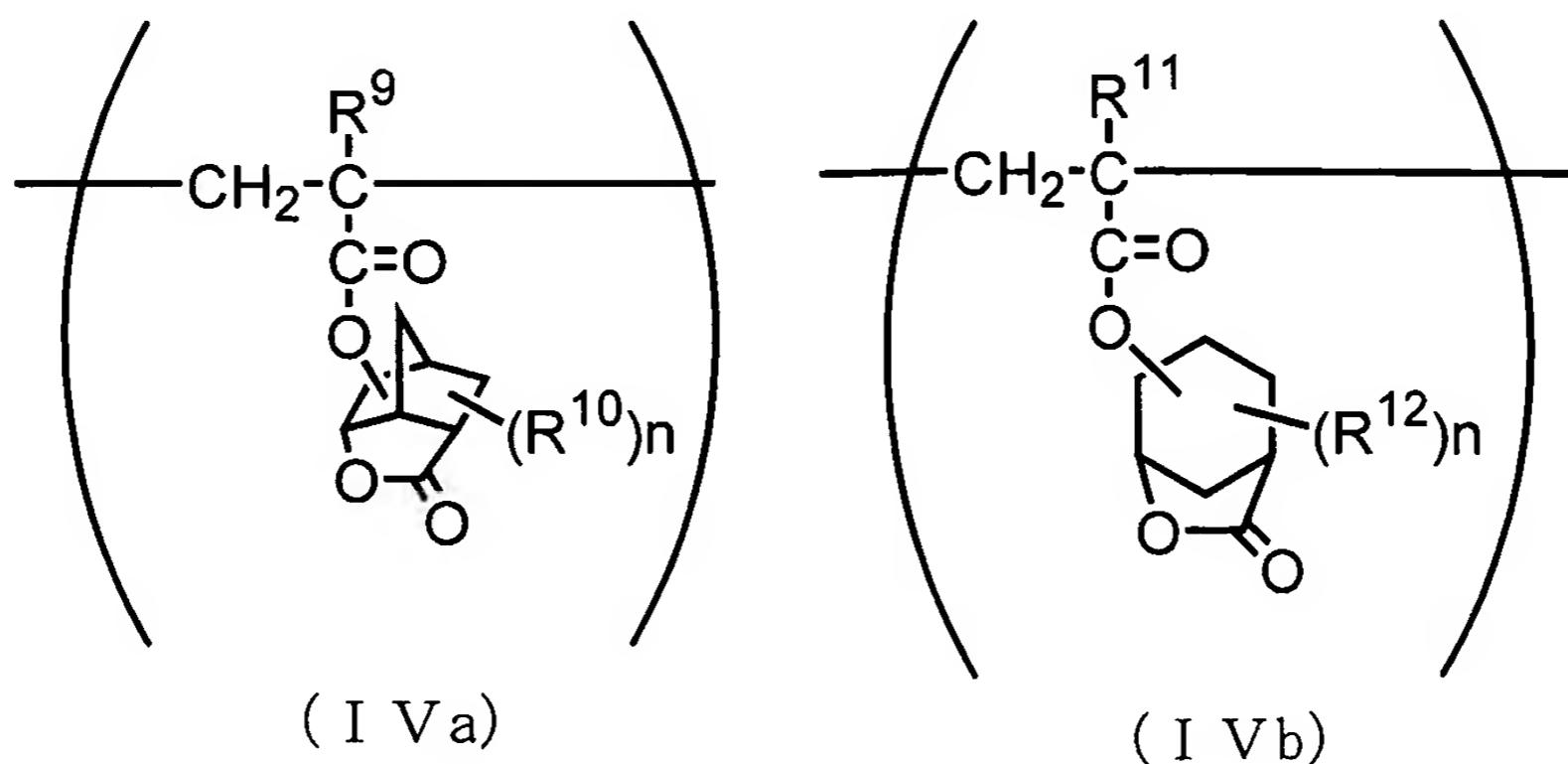
2. **(previously presented):** The composition according to Claim 1, wherein the content of the nitrogen containing compound of the formula (IIIa), the content of the resin, and the content of the acid generator are 0.01 to 1 % by weight, 80 to 99.89 % by weight and 0.1 to 19.99 % by weight, respectively, based on the total solid content of the composition.

3-4. **(canceled).**

5. **(original):** The composition according to Claim 1, wherein the content of the structural unit having an acid labile group is 10 to 80 % by weight in the total structural units of the resin.

6. **(previously presented):** The composition according to Claim 1, wherein the structural unit having an acid-labile group is a structural unit derived from a 2-alkyl-2-adamantyl (meth)acrylate or a 1-(1-adamantyl)-1-alkylalkyl (meth)acrylate.

7. **(previously presented):** The composition according to Claim 1, wherein the resin contains, in addition to the structural unit having the acid-labile group and the structural unit derived from 2-norbornene and a structural unit derived from an aliphatic unsaturated dicarboxylic acid, further at least one structural unit selected from the group consisting of a structural unit derived from 3-hydroxy-1-adamantyl (meth)acrylate, a structural unit derived from 3,5-dihydroxy-1-adamantyl (meth)acrylate, a structural unit derived from (meth)acryloyloxy- γ -butyrolactone having a lactone ring optionally substituted by alkyl, a structural unit of the formula (IVa) and a structural unit of the following formula (IVb):

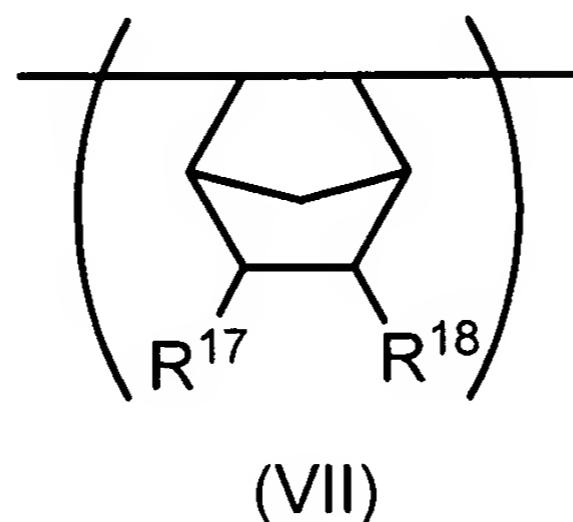


wherein R⁹, R¹⁰, R¹¹ and R¹² each independently represent hydrogen or methyl, and n represents an integer of 1 to 3, with the proviso that when n is more than 1, each of the plurality of R¹⁰ or R¹² may be different.

8. **(canceled).**

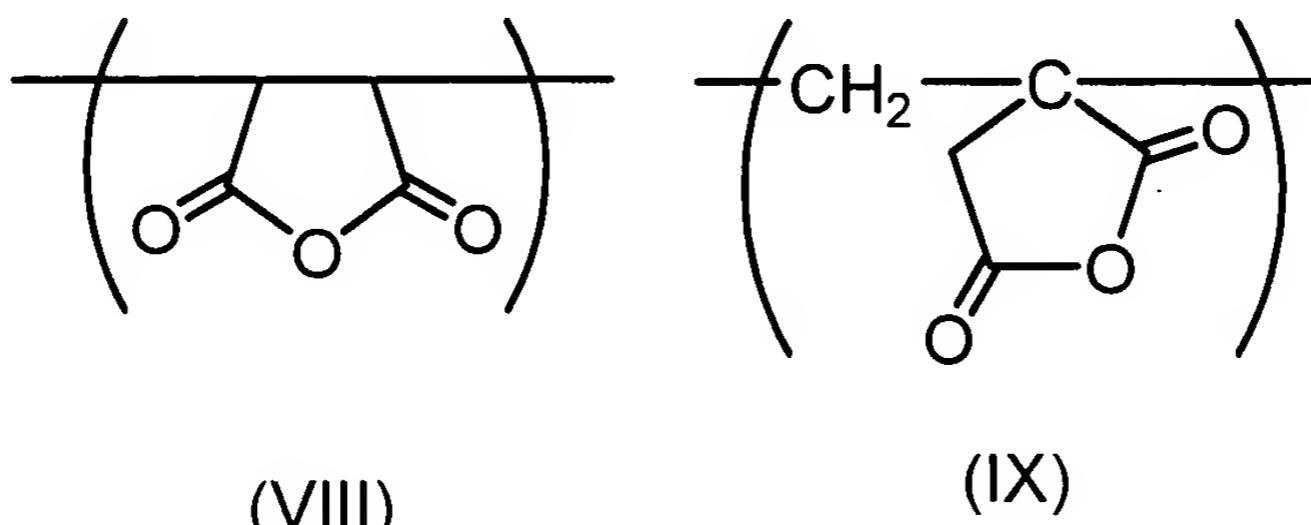
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9. (previously presented): The composition according to Claim 1, wherein the structural unit derived from 2-norbornene is a structural unit of the formula (VII):



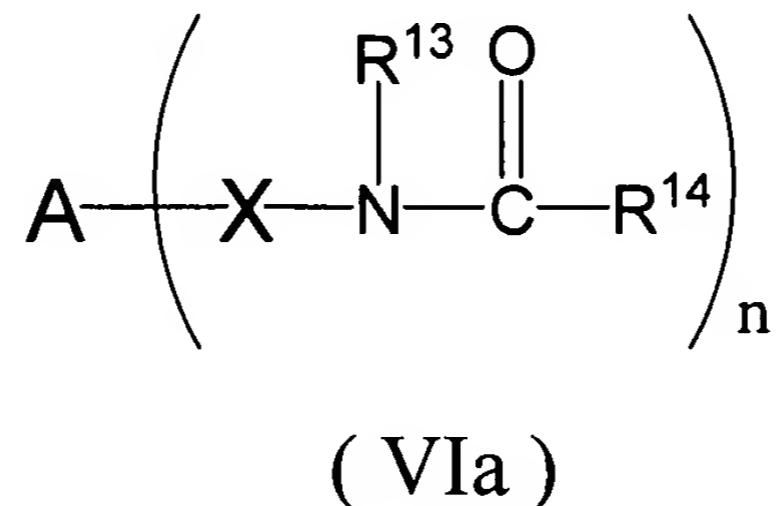
wherein R¹⁷ and R¹⁸ each independently represent hydrogen, alkyl having 1 to 3 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, carboxyl, cyano or a -COOZ group in which Z represents an alcohol residue, or R¹⁷ and R¹⁸ bond together to form a carboxylic anhydride residue represented by -C(=O)OC(=O)-, and

the structural unit derived from the aliphatic unsaturated dicarboxylic anhydride is at least one structural unit selected from the group consisting of the formulae (VIII) and (IX):



10. (original): The composition according to Claim 1, which further comprises a surfactant.

11. (new): A chemical amplification type positive resist composition comprising a nitrogen containing compound of the formula (VIa):

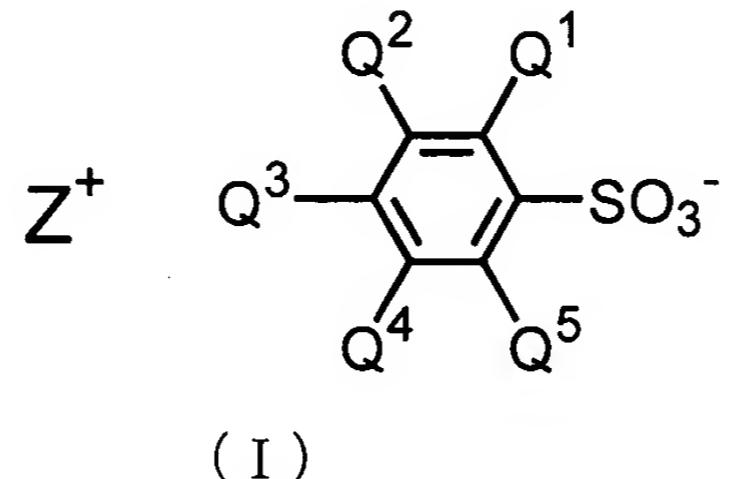


wherein A represents an alicyclic hydrocarbon group optionally substituted, X represents alkylene having 1 to 4 carbon atoms or a single bond, R¹³ represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one -CH₂- other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, or an aromatic group optionally substituted, R¹⁴ represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one -CH₂- other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, an aromatic hydrocarbon group optionally substituted, or arylamino optionally substituted, and n denotes an integer of 1 to 5, with the proviso that when n is 2 or more, each of -X-NR¹³-CO-R¹⁴ in the formula (VIa) may be different,

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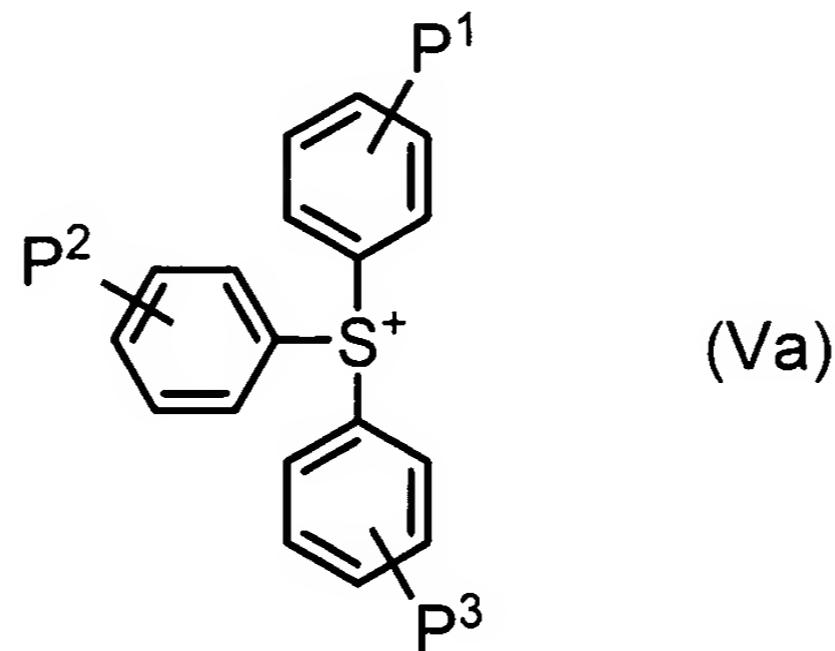
a resin which contains a structural unit having an acid labile group and which itself is insoluble or poorly soluble in an alkali aqueous solution but becomes soluble in an alkali aqueous solution by the action of an acid and which further contains a structural unit derived from 2-norbornene and a structural unit derived from an aliphatic unsaturated dicarboxylic anhydride; and

an acid generator of the formula (I):



wherein Q^1 , Q^2 , Q^3 , Q^4 and Q^5 each independently represent hydrogen, hydroxyl, alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 12 carbon atoms or an electron-withdrawing group, and Z^+ represents a group of the formula (Va), (Vb) or (Vc):

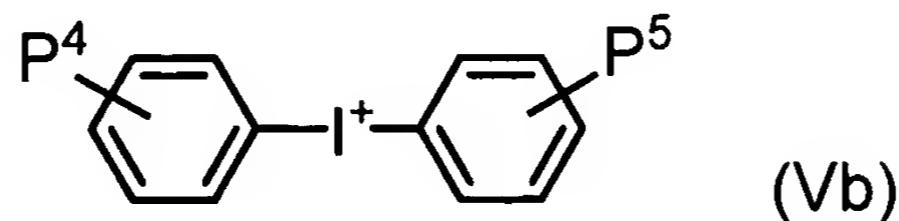
a group of the formula (Va):



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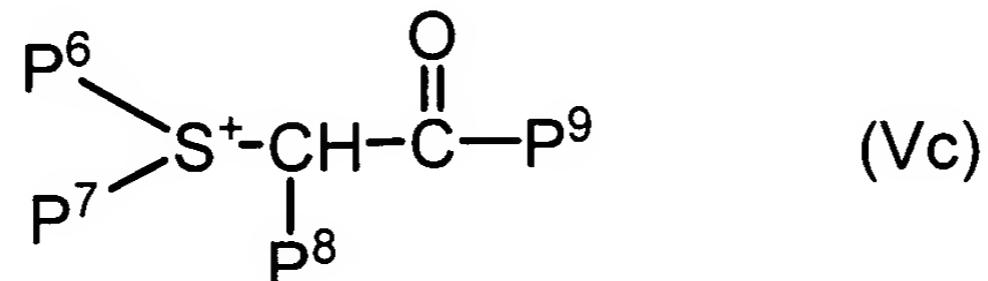
wherein P¹, P² and P³ each independently represent hydrogen, hydroxyl, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms;

a group of the formula (Vb):



wherein P⁴ and P⁵ each independently represent hydrogen, hydroxyl, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms;

a group of the formula (Vc):



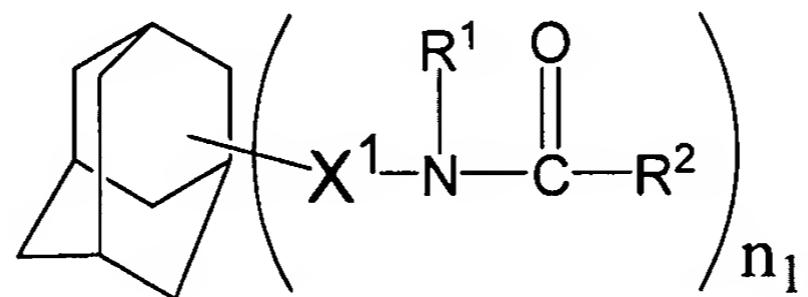
wherein P⁶ and P⁷ each independently represent alkyl having 1 to 6 carbon atoms or cycloalkyl having 3 to 10 carbon atoms, or P⁶ and P⁷ bond to form divalent acyclic hydrocarbon having 3 to 7 carbon atoms which form a ring together with the adjacent S⁺, and at least one -CH₂- in the divalent acyclic hydrocarbon may be substituted by -CO-, -O- or -S-; P⁸ represents hydrogen, P⁹ represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms or an aromatic group optionally substituted, or P⁸ and P⁹ bond to form 2-oxocycloalkyl together with the adjacent -CHCO-.

12. (new): The composition according to Claim 1, wherein the content of the nitrogen containing compound of the formula (IIIa), the content of the resin, and the content of the acid

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generator are 0.01 to 1 % by weight, 80 to 99.89 % by weight and 0.1 to 19.99 % by weight, respectively, based on the total solid content of the composition.

13. (new): The composition according to Claim 1, wherein the nitrogen containing compound is a compound of the formula (IIa) :



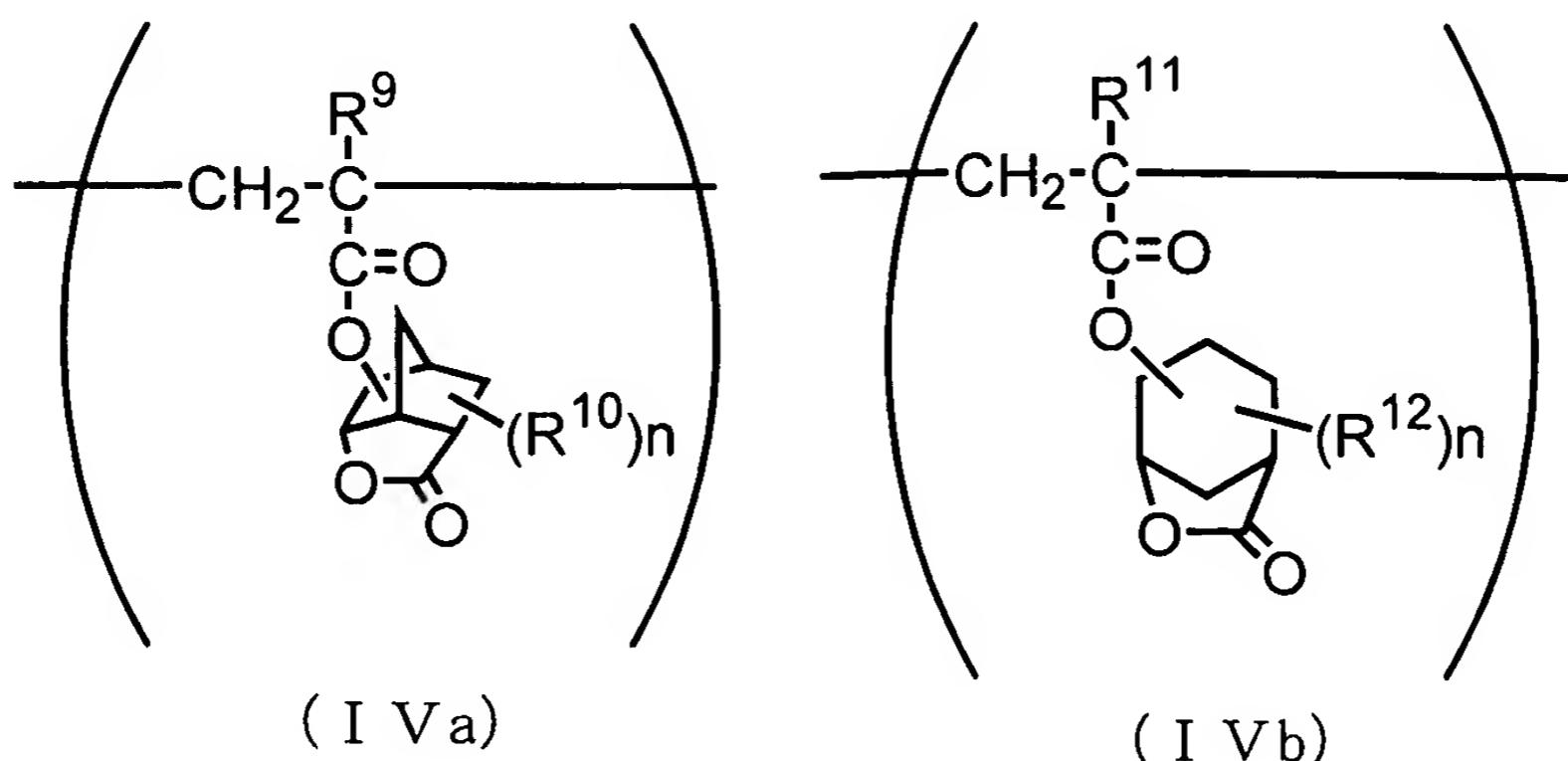
wherein X¹ represents alkylene having 1 to 4 carbon atoms or a single bond, R¹ represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one -CH₂- other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, or an aromatic hydrocarbon group optionally substituted, R² represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, haloalkyl having 1 to 12 carbon atoms, alkyl having 2 to 12 carbon atoms in which at least one -CH₂- other than that binding to the adjacent group is substituted by -S- or -O-, alkoxy having 1 to 12 carbon atoms, an aromatic hydrocarbon group optionally substituted, or arylamino optionally substituted, and n₁ denotes an integer of 1 to 5, with the proviso that when n₁ is 2 or more, each of -X¹-NR¹-CO-R² in the formula (IIa) may be different.

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14. (new): The composition according to Claim 1, wherein the content of the structural unit having an acid labile group is 10 to 80 % by weight in the total structural units of the resin.

15. (new): The composition according to Claim 1, wherein the structural unit having an acid-labile group is a structural unit derived from a 2-alkyl-2-adamantyl (meth)acrylate or a 1-(1-adamantyl)-1-alkylalkyl (meth)acrylate.

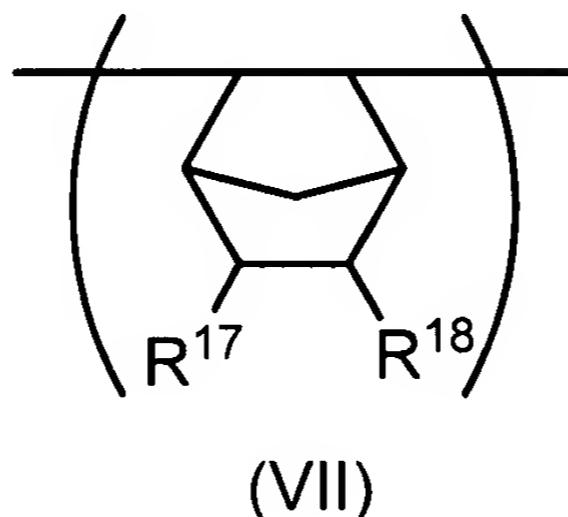
16. (new): The composition according to Claim 1, wherein the resin contains, in addition to the structural unit having the acid-labile group and the structural unit derived from 2-norbornene and a structural unit derived from an aliphatic unsaturated dicarboxylic anhydride, further at least one structural unit selected from the group consisting of a structural unit derived from 3-hydroxy-1-adamantyl (meth)acrylate, a structural unit derived from 3,5-dihydroxy-1-adamantyl (meth)acrylate, a structural unit derived from (meth)acryloyloxy- γ -butyrolactone having a lactone ring optionally substituted by alkyl, a structural unit of the formula (IVa) and a structural unit of the following formula (IVb):



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wherein R^9 , R^{10} , R^{11} and R^{12} each independently represent hydrogen or methyl, and n represents an integer of 1 to 3, with the proviso that when n is more than 1, each of the plurality of R^{10} or R^{12} may be different.

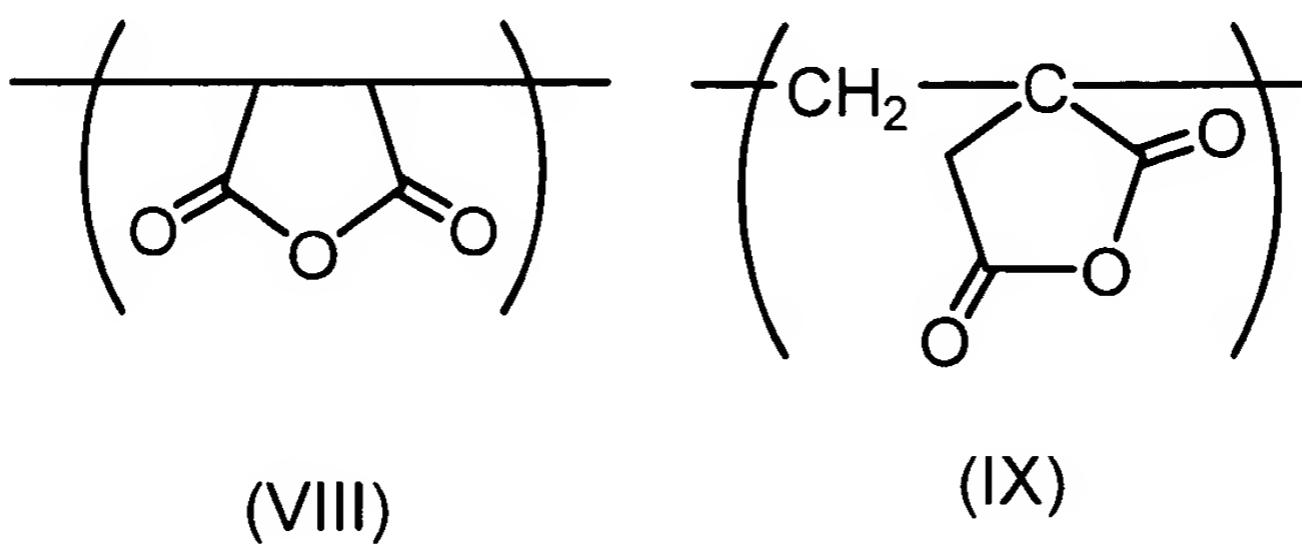
17. (new): The composition according to Claim 1, wherein the structural unit derived from 2-norbornene is a structural unit of the formula (VII):



(VII)

wherein R^{17} and R^{18} each independently represent hydrogen, alkyl having 1 to 3 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, carboxyl, cyano or a $-COOZ$ group in which Z represents an alcohol residue, or R^{17} and R^{18} bond together to form a carboxylic anhydride residue represented by $-C(=O)OC(=O)-$, and

the structural unit derived from the aliphatic unsaturated dicarboxylic anhydride is at least one structural unit selected from the group consisting of the formulae (VIII) and (IX):



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18. (new): The composition according to Claim 1, which further comprises a surfactant.